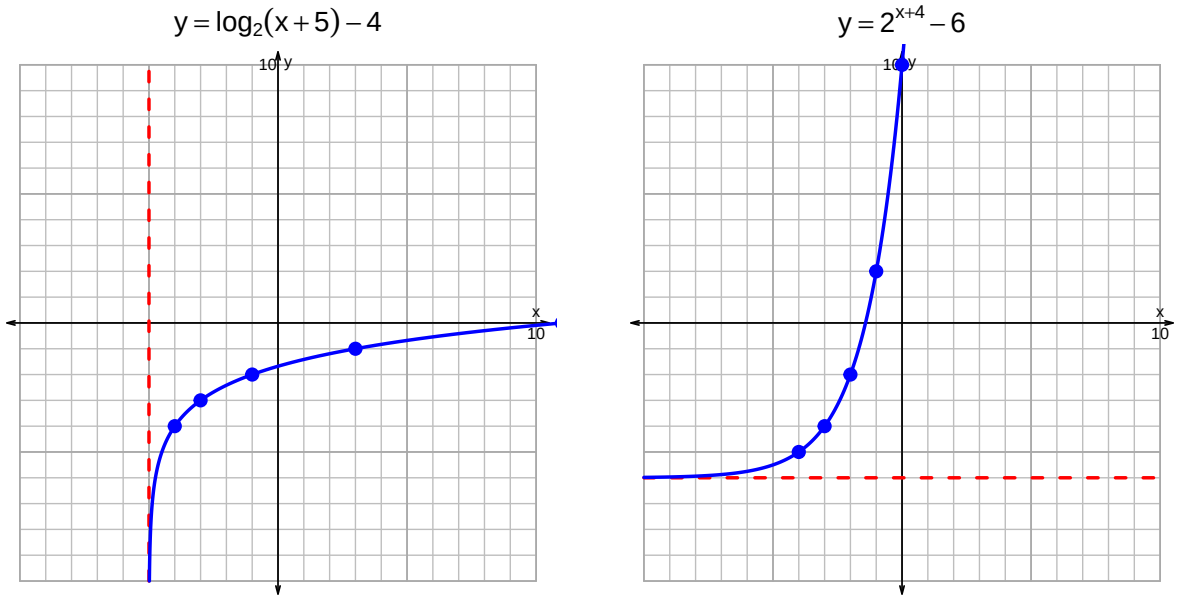
Name: Date:

s18quiz: EXP LOG (Solution v114)

1. Graph $y = \log_2(x+5) - 4$ and $y = 2^{x+4} - 6$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$23 = \left(\frac{4}{5}\right) \cdot 2^{3t/7}$$

Divide both sides by $\frac{4}{5}$.

$$\frac{23 \cdot 5}{4} = 2^{3t/7}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{23 \cdot 5}{4}\right) = \frac{3t}{7}$$

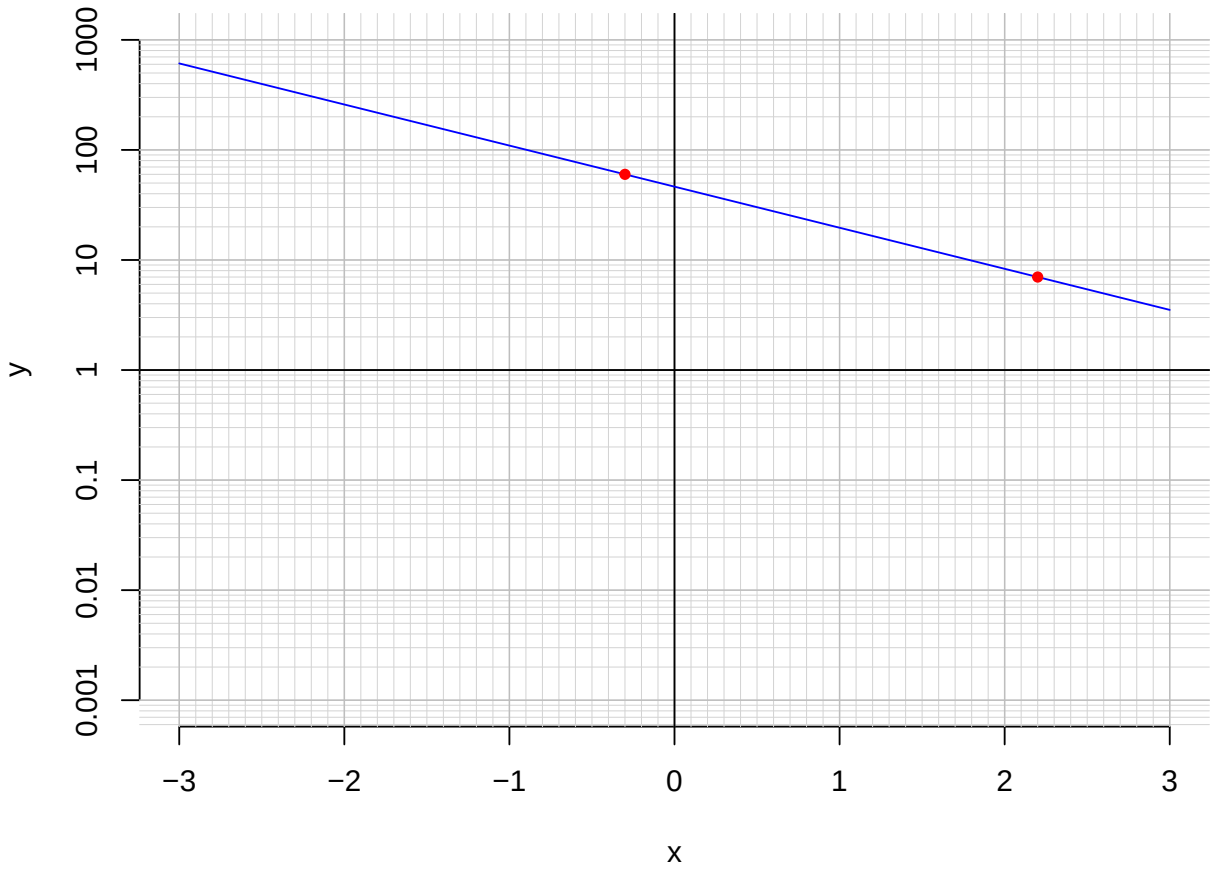
Divide both sides by $\frac{3}{7}$.

$$\frac{7}{3} \cdot \log_2\left(\frac{23 \cdot 5}{4}\right) = t$$

Switch sides.

$$t = \frac{7}{3} \cdot \log_2\left(\frac{23 \cdot 5}{4}\right)$$

3. An exponential function $f(x) = 46.4 \cdot e^{-0.859x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.2)$.

$$f(2.2) = 7$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.859} \cdot \ln\left(\frac{x}{46.4}\right)$$

c. Using the plot above, evaluate $f^{-1}(60)$.

$$f^{-1}(60) = -0.3$$